

MISSOURI CONSERVATIONIST

VOLUME 81, ISSUE 2, FEBRUARY 2020
SERVING NATURE & YOU



3 Things YOU Can Do to Help Pollinators

1

Plant Natives

Native plants are a food source for bees, butterflies, and other pollinators. Add the plants shown below to your landscape.

2

Keep it Blooming

Keep something in bloom each season. Some species bloom all year, others only in April and May, still others in July and August. Learn more at mdc.mo.gov/monarch.

3

Get Involved

Protect native grasslands, provide nesting places, and become a wildlife gardener. To learn how, visit GrowNative.org.



Common milkweed



New England aster



Showy goldenrod



Prairie blazing star



Wild bergamot



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VOLUME 81, ISSUE 2



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Bobcat



MISSOURI CONSERVATIONIST



ON THE COVER

Common mergansers fly over a pond during winter migration.

NOPPADOL PAOTHONG

300–800mm lens, f/8
1/2000 sec, ISO 800

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FAN MAIL

Although I'm not a resident of Missouri, I thoroughly enjoy both the *Conservationist* and *Xplor* magazines. They are outstanding! The content and design are always top notch.

Julie Vogel
Lakeland, Florida

OH DEER

When opening day of firearms deer season started, I found myself in one of my favorite places — my deer stand. This was my 50th consecutive opening day. This is a privilege I do not take lightly. Thanks to MDC for the work you do to help the state deer herd increase, making it desirable to hunt deer. I realize many have sacrificed their deer season so I could enjoy mine — our great men and women of our U.S. armed forces. One other person helped to make this happen — my wife. She has been on board with me hunting for 45 of those 50 years. The last 20 or so joining me in the deer woods. I've tried to pass this great heritage onto many, young and old alike, including my daughters, their husbands, and all eight of my grandchildren.

Randy Yancey Dexter

I have been hunting deer in Missouri for the past three years. As I was leaving my hunting location this season, I encountered Conservation Agent Kevin Powell in Adair County. He was very professional and courteous throughout our conversation. Being a 29-year state law enforcement officer, I was thoroughly impressed with his high level of professionalism. He is a great asset and ambassador for your agency and the great state of Missouri.

Rick Jacobs Rome, Georgia

Thank you for providing such great hunting and fishing opportunities in your state. I spend more time there in the outdoors than in my own state.

Travis Lewis Piggott, Arkansas

BIRDS OF PREY

I have enjoyed your publication since the 1950s. I really liked *St. Louis: Where Birds of Prey Abound* in the November issue [Page 18]. Keep up the good work.

Richard Bentley Ballwin

MAGAZINE FANS

Thanks to the editors, authors, photographers, and others who put together the *Missouri Conservationist* every month. I could not resist reading every single page of the December issue as soon as it arrived. The devotion of a life-long bird watcher, the skills of wood carvers making duck decoys, pioneering attempts to control invasive Asian carp, and a new-to-me conservation area to explore sucked me right into the pages. And a black-walnut chocolate biscotti recipe in time for Christmas cookie season? Yay!

Mary Jones via email

CLARIFICATION

In the December issue, *Brad's Big Year* [Page 10] described one man's quest to tally more bird species in a year than anyone else in Missouri. The article led readers to believe that Brad Jacobs is Missouri's sole Big Year record holder. In fact, who holds the record is subject for debate, and a birder named Kendell Loyd also claims the title.

Competitive birders follow strict rules governing which birds they can include in their tallies. For example, a wild turkey is countable. A domesticated turkey is not. The controversy over the title stems from the fact that Mr. Jacobs followed one set of rules, and Mr. Loyd followed another. Both birders published their Big Year lists and the rules that they followed in *The Bluebird*. To read their accounts, visit mobirds.org/ASM/Bluebird.aspx. Mr. Jacobs' article is in the March 2019 edition; Mr. Loyd's is in the September 2019 edition.

In our article, we should have recognized Mr. Loyd for his achievement. We also should have recognized Debbie and Steve Martin. Although neither Mrs. nor Mr. Martin tallied enough birds to claim the title, both birders surpassed the previous Big Year record, which was set in 1991. Finally, the article noted that Mr. Loyd was a graduate student when, in fact, he was a full-time teacher.

—THE EDITORS

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Send a note using our online contact form at mdc.mo.gov/commissioners.



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Share your photos on Flickr at
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on your Instagram photos.



1

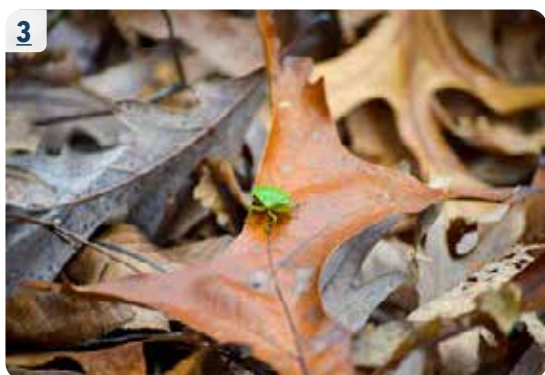
1 | Coyotes by
[theoldchurchgallery](#),
via Instagram

2 | Winter trout
fishing by [Karen
McGillis](#), via
MDC website

3 | Stinkbug in
winter by [djferg](#),
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2



3

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Up Front

with Sara Parker Pauley

✱ It's February, the month of Valentine's Day, and thus the birds and bees theme in this month's features [Pages 10–27]. So, it made me think of lovebirds — the lovebirds of conservation and the affection they felt not only for each other, but for our treasured natural resources.

Let's start with Aldo Leopold, the father of wildlife conservation, and his bride, Estella. They share an amazing love story that starts in New Mexico. He worked for the U.S. Forest Service and she was a schoolteacher. After moving to Colorado, he feigned off the competition by courting her through letters. No surprise there, his superpower was his writing. Five children, *A Sand County Almanac*, and an amazing conservation legacy later, the two were the ultimate power couple. *15-love*.

Then there's Missouri's own Charlie and Libby Schwartz — both brilliant and accomplished scientists, writers, professionals, side by side in the field. You rarely found one without the other. At their MDC retirement in 1981, this was said of them: "No two individuals have contributed more than Charles and Libby Schwartz to the success of Missouri conservation — past, present, and future." *30-love*.

The couples of conservation list could go on and on, like Edward D. and Pat Jones, the godparents of the Katy Trail and Prairie Fork Conservation Area; or Leo and Kay Drey of Pioneer Forest and LAD Foundation. *40-love!*

So, here's to all the lovebirds of conservation, from Missouri and beyond. It's what the world needs now — love sweet love! *Game-Set-Match*.

Sara Parker Pauley

SARA PARKER PAULEY, DIRECTOR
SARA.PAULEY@MDC.MO.GOV

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Printed with soy ink



mdc.mo.gov 3

Nature LAB

by Bonnie Chasteen

Each month, we highlight research MDC uses to improve fish, forest, and wildlife management.

RESOURCE SCIENCE

Natural Heritage Program

✱ “To keep every cog and wheel is the first precaution of intelligent tinkering,” wrote Aldo Leopold, the father of American conservation, nearly 80 years ago.

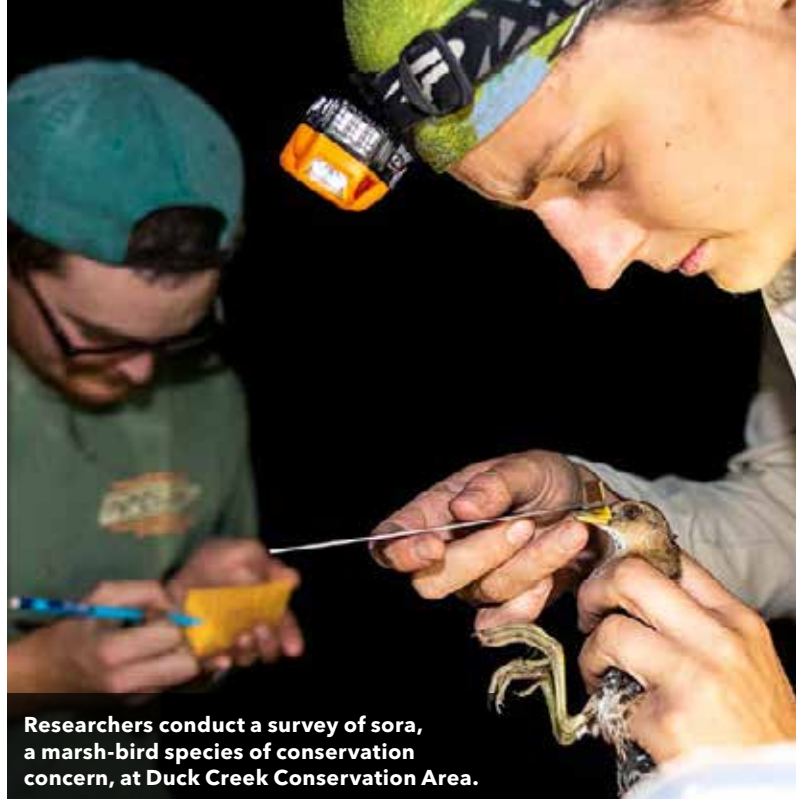
He emphasized the need to identify, track, and conserve every element of our natural heritage, no matter how rare or obscure.

“This is because we have no idea how valuable declining and uncommon species and habitats may be to us in the future,” said Natural Heritage Coordinator Dorothy Butler.

“For example, our native species could hold medical, economic, or ecosystem values that we have not yet discovered.”

Butler manages Missouri’s Natural Heritage Database, which began in 1981. Since then, the Missouri Natural Heritage Program (MNHP) has continued to be the state’s most comprehensive source for information about species and natural communities of conservation concern.

This database supports conservation planning, research, species recovery, and land management here



Researchers conduct a survey of sora, a marsh-bird species of conservation concern, at Duck Creek Conservation Area.

Information helps MDC prioritize and focus conservation and restoration efforts

in the Show-Me State. It also adds value to NatureServe, the coordinating body of all Natural Heritage Programs in the United States, which helps identify the ranges and distribution of species of conservation concern across states.

To date, MNHP contains more than 36,000 plant, animal, and natural community records, and more are added every year. Butler has seen the program grow from a small set of information to one that is integral in focusing on-the-ground conservation actions in Missouri.

MDC Habitat Coordinator Nate Muenks said the MNHP’s ever-growing body of information helps MDC develop the State Wildlife Action Plan to focus and prioritize its conservation efforts. “Pinpointing our work on areas with the greatest potential for success gives us — and all Missourians — the biggest bang for the conservation buck.”

Natural Heritage Program at a Glance

Bald eagle

1,160

Species of Conservation Concern

742 Plants
236 Invertebrates (94 aquatic + 142 terrestrial)
14 Amphibians
21 Reptiles
65 Fish
50 Birds
32 Mammals

Hellbender

Mead's milkweed

120 Natural Communities

35 Aquatic
85 Terrestrial



Program Informs State Wildlife Action Plan
Conservation priority areas shown in gold

In Brief

News and updates from MDC



BUY YOUR 2020 HUNTING AND FISHING PERMITS

2019 PERMITS
SET TO EXPIRE

➔ Annual hunting and fishing permits expire at the end of February, including 2019 permits for small game, fishing, trout fishing, and combination hunting and fishing.

Buy Missouri hunting and fishing permits from vendors around the state, online at mdc.mo.gov/buypermits, or through MDC's free mobile apps, MO Hunting and MO Fishing, available for download through Google Play for Android devices or the App Store for Apple devices.

Save time by buying hunting and fishing permits for multiple people in a single transaction. Select the *Additional Customer* option during the permit purchase.

Try our online permit auto renewal service to automatically renew your permits prior to the start of the next season or permit year, so you never have an expired permit when you need it most. Enrollment in auto renewal can be done during an online permit purchase or by using the *Manage Your Account* feature.

Commercial and lifetime permits can be purchased only through the MDC Permit Services Unit by calling 573-522-0107 for an application.

GET HOOKED ON MISSOURI TROUT FISHING

March 1 marks the annual opening of catch-and-keep trout fishing in Missouri's four trout parks: Bennett Spring State Park near Lebanon, Montauk State Park near Licking, Roaring River State Park near Cassville, and Maramec Spring Park near St. James. The catch-and-keep season runs through Oct. 31.

MDC operates trout hatcheries at all four parks and stocks rainbow trout daily throughout the season.

Trout anglers need a daily trout tag to fish in Missouri's trout parks. Daily trout tags can only be purchased at each of the four trout parks. In addition to the daily tag, Missouri residents 16 through 64 and nonresidents 16 and older also need a fishing permit.

The cost of a daily trout tag to fish at three of Missouri's four trout parks — Bennett Spring State Park, Montauk State Park, and Roaring River State Park — is \$4 for adults and \$3 for those 15 and younger. A daily fishing permit for Missouri resident is \$7 and \$8 for nonresidents. The daily limit is four trout.

MDC is conducting a pilot program at Maramec Spring Park where the daily limit will be raised from four to five trout and the cost of a daily trout tag for adults will go from \$3 to \$5 and from \$2 to \$3 for anglers 15 and younger. The statewide possession limit will now be 10.

Trout hatcheries are just one way conservation pays in Missouri. MDC staff stock more than 800,000 trout annually at the state's four trout parks and approximately 1.5 million trout annually statewide. Trout anglers spend more than \$100 million each year in the Show-Me State, which generates more than \$180 million in business activity, supports more than 2,300 jobs, and creates more than \$70 million dollars in wages. About 30 percent of Missouri trout anglers come from other states, so a substantial portion of trout fishing expenditures is "new money" for the state's economy.

Missouri also offers excellent trout fishing throughout the state on rivers and streams that support naturally reproducing trout. For more information on trout fishing in Missouri, visit short.mdc.mo.gov/Zou.

REMINDER TO TROUT ANGLERS: To prevent the spread of the invasive alga called didymo or "rock snot," the use of shoes, boots, or waders with porous soles of felt, matted, or woven fibrous material is prohibited at all trout parks, trout streams, Lake Taneycomo, and buffer areas. Get more information at short.mdc.mo.gov/Z3K.



Brown trout

Ask MDC

Got a Question for Ask MDC?

Send it to AskMDC@mdc.mo.gov or call 573-522-4115, ext. 3848.

Q: I came across several oak trees marred by horizontal lines. Are they diseased or is this a natural occurrence?

➔ What you've noticed is damage caused by a yellow-bellied sapsucker (*Sphyrapicus varius*).

These small, enterprising woodpeckers drill closely spaced holes in trees to extract the sweet sap. In the process of drilling, they eat the inner bark and lap up trapped insects — ants, for instance — with their specialized, brush-tipped tongues. But these birds tend to rely more on the tree's sap, rather than insects, for its diet.

Typically, sapsuckers do not kill a tree. But some trees or shrubs may die if holes are extensive enough to girdle the trunk or stem.

Q: While cleaning out my wood duck nesting boxes, I found two boxes with unhatched eggs in them. What might be the cause of this?

➔ This is a common occurrence. Because duck eggs and ducklings are a popular food source for predators, most ducks lay numerous eggs and try to raise as many young as possible. Usually, wood duck hens lay 12 to 14 eggs in a clutch. Sometimes other wood duck hens will "dump" their



Sapsucker damage

eggs in the same cavity — increasing the number to as many as 20 and leaving the first hen to incubate the whole lot.

If you see only a few eggs, cool to the touch, and they aren't covered with down feathers, it's a sign the clutch was abandoned, possibly because they were infertile. Hens also will abandon nests if too many people, predators, or loud traffic disturb them. It's also possible these were second, late-in-the-season clutch attempts, and the hens either were busy with their first clutch or they were killed.

Q: During a recent nighttime walk, my wife and I observed a handsome adult spotted salamander on the wet pavement. We



Spotted salamander

wanted to take a picture of it, but wondered if shining a light, or the flash of a camera, might be harmful to it. Also, is it normal for salamanders to be on the move in early February?

→ Spotted salamanders (*Ambystoma maculatum*) venture forth at night in search of worms, insects, spiders, and land snails, and they are often seen crossing roads on warm, rainy nights in spring.

It's normal for spotted salamanders to be active in early February. In fact, many of Missouri's salamanders and frogs can tolerate the cold and begin breeding in late

winter. During the first warm rains of early February and mid-March, spotted salamanders congregate in shallow, fishless, woodland ponds to court and lay eggs. Rainfall and temperatures greater than 50 are needed to stimulate these breeding migrations.

Briefly shining a light or taking a photograph won't harm the animal, as long as it's allowed to continue on its way toward a breeding pond, said Missouri State Herpetologist Jeff Briggler. The bigger threat is being run over. If you see such an animal crossing, place it on the side of the road in the direction it's traveling.



Hayley Honeycutt
ST. FRANCOIS COUNTY
CONSERVATION AGENT

offers this month's

AGENT ADVICE

Missouri is a great place to fish, even in the winter. The state is home to several types of trout fishing areas, some of which switch to catch-and-keep Feb. 1. The Missouri Department of Conservation stocks trout in lakes across the state beginning in November, so they are ready to go for your next visit. All you need is a fishing permit and a trout permit. Remember, February is still cold, especially around the water. Dress in layers and keep your fingers covered and your feet dry. Each trout area has its own special rules, so educate yourself about the one you are visiting before heading out. For more information, visit huntfish.mdc.mo.gov/fishing/species/trout.

What IS it?

Can you guess this month's natural wonder?

The answer is on
Page 9.





MOROCCAN SPICED-BRAISED VENISON

Here's a new take on venison that also works well with lamb. This recipe appears in *Cooking Wild in Missouri* by Bernadette Dryden, and according to the book, the meat becomes fork tender as it simmers in the spicy, rich tomato sauce. This hearty meal is sure to warm you on a cold February day!

SERVES 2 TO 4

3 tablespoons extra-virgin olive oil
2 pounds venison round steak
Salt and coarsely ground pepper
1 teaspoon cardamom seeds
1 teaspoon cumin seeds
1 lemon, cut thinly into 8 to 10 slices
4 medium garlic cloves, sliced
1 medium onion, chopped
1 4-ounce jar chopped pimientos or 1 red bell pepper
1 tablespoon dried pepper flakes (preferably ancho)
½ cup prunes, pitted
1 cup chicken stock
1 15-ounce can diced tomatoes

In a 4-quart cast-iron pot, heat olive oil over medium heat. Salt and pepper steaks on both sides and add to hot oil. After first side is browned, turn over and add cardamom and cumin seeds to the oil around meat, and stir to heat seeds thoroughly. Add lemon, garlic, onion, and pimientos (or red pepper) and stir. Cook until onion is softened. Add pepper flakes, prunes, stock, and tomatoes. Turn meat over, stir thoroughly and cover with lid. Simmer atop burner for 2 to 3 hours until meat is tender.

Place meat on heated platter and cover. Skim fat from pot and bring contents to a boil to reduce liquids. Season to taste and pour over venison.

Serve with couscous or saffron rice.



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CONSERVATION COMMISSION SETS DEER, TURKEY HUNTING DATES

2020 Spring and Fall Turkey Hunting Dates

- ✖ Spring Youth Portion: April 4–5
- ✖ Regular Spring Turkey Season: April 20–May 10
- ✖ Fall Firearms Turkey Season: Oct. 1–31

2020–2021 Archery Deer and Turkey Hunting Dates

- ✖ Sept. 15–Nov. 13
- ✖ Nov. 25–Jan. 15, 2021

2020–2021 Firearms Deer Hunting Dates

- ✖ Firearms Deer Early Youth Portion: Oct. 31–Nov. 1
- ✖ Firearms Deer November Portion: Nov. 14–24
- ✖ Firearms Deer Late Youth Portion: Nov. 27–29
- ✖ Firearms Deer Antlerless Portion: Dec. 4–6
- ✖ Firearms Deer Alternative Methods Portion: Dec. 26–Jan. 5, 2021

Details on hunting regulations, harvest limits, allowed methods, required permits, and other related information will be available in MDC's *2020 Spring Turkey Hunting Regulations and Information* and MDC's *2020 Fall Deer & Turkey Hunting Regulations and Information* booklets. Both will be available where permits are sold prior to the related seasons.

ARBOR AWARD OF EXCELLENCE NOMINATIONS

MDC and the Missouri Community Forestry Council (MCFC) are accepting nominations for the 2020 Missouri Arbor Award of Excellence. The annual award recognizes communities, institutions, businesses, organizations, and individuals that make significant and long-lasting efforts to care for trees in their communities. Nominations are due by Friday, March 6.

"Trees bring so much value to our communities, but their overall health depends on people practicing good tree stewardship on both public and private property," said MDC Community Forestry Program Supervisor Russell Hinnah. "The more we work to take care of our trees, the more trees work for us by increasing property values, improving our air, saving energy, protecting our watersheds, and more."

The Arbor Award of Excellence shines the spotlight on anyone who has improved trees in their community. Any significant program, project, or event that contributes to the care or maintenance of trees could qualify for an award.

"This award recognizes projects that demonstrate a sustained overall effort to care for trees," said Hinnah. "I encourage everyone to consider the wonderful tree work in their communities and to nominate those who made it possible."

Winners receive a framed award, a full registration scholarship to the 2020 MCFC conference in October, an extra ticket to the award banquet during the conference, a community forestry reference book, a \$50 gift card, and a 5 percent bonus cost share if selected for funding through MDC's Tree Resource Improvement and Maintenance cost-share program.

For more information and nomination forms, visit mdc.mo.gov and search Missouri Arbor Award of Excellence.

WHAT IS IT? EASTERN SCREECH-OWL

More often heard than seen, the eastern screech-owl (*Otus asio*) has a distinctive call, but it's rarely described as a screech. Rather, the whistled call comes out as an ascending then descending whinny or a monotone trill. This time of year, eastern screech-owls use their call to search for a mate. Eastern screech-owls are the only small owl with prominent ear tufts in Missouri. They can be found in three color morphs — gray, brown, and red.



the Birds AND the Bees

With all due respect to Presidents' Day, there's only one February holiday that really creates a buzz — Valentine's Day.

Although the landscape can be bleak this time of year and winter's presence chillingly obvious, the *Missouri Conservationist*, like many of you this time of year, is turning its attention to the birds and the bees. In our case, birds and bees isn't a euphemism for romance, but actual affection for the birds and bees that not only bring us enjoyment to watch, but also play a key role in the food we eat.

Much has been made of the effect that colony collapse has had on nonnative honeybees — and the important work honeybees do in pollinating many of our food crops — but less attention

has been paid to the work of Missouri's more than 450 species of native bees. In *A City Abuzz* [Page 12], we look at these species, interesting new research, and what you can do in your backyard to help.

Spring signals the return of many migratory species to our bird feeders, but few bring the level of excitement that accompany the arrival of the ruby-throated hummingbird. In *Hosting Hummingbirds* [Page 20], we highlight the success of one Missouri resident in attracting hummingbirds, and steps you can take to increase the number of hummingbirds outside your window.

While it's still another month or more before we start seeing the first signs of many of our pollinators — like Missouri's native bees — and return of our Neotropical migratory birds — like the ruby-throated hummingbird — it's not too early to remind ourselves of the importance of these creatures and begin preparing for their return.



Bumblebee



Ruby-throated hummingbird pollinates a swamp milkweed



**Male common
eastern bumblebee
on aster**



A City About

RESEARCH FINDS AN OASIS OF BEES IN
ST. LOUIS LAWNS, GARDENS

by Erin Shank | photos by Noppadol Paothong

The frozen February ground at the Fresh Gatherings Garden in St. Louis looks bleak, brown, and lifeless. It's been months since the last color faded from blooms, and the final batch of harvested herbs flavored a meal. But not far below the surface, baby bees are morphing, biding their time to emerge from the ground and perform what is arguably the most important service of any wildlife in our state: pollination. And as it turns out, our cities are providing important habitat for a diversity of wild bees.

“Many bees can live their entire lives in an area the size of an average city yard, provided there is a diversity of flowers. This fact makes this a global conservation issue where one person can make a difference.”

— Saint Louis University researcher Damon Hall



Female bicolored striped sweat bee on purple coneflower

Pollination is the fundamental ecological process that drives our green world, and it is how plants, both wild and cultivated, reproduce and maintain genetic diversity. The importance of bees to agriculture and human health is well-known — think of strawberries, tomatoes, blueberries, and sunflower seeds. One in three bites of food we consume in the United States is the product of bee pollination. Much of the food in our country is pollinated by wind, water, or honeybees, an imported Eurasian species that functions as livestock. But approximately 30 percent of U.S. crops rely on native bees for pollination, including a large portion of our most interesting and nutritious foods such as fruits, nuts, and alfalfa.

Beyond Food

Far less understood — and appreciated — is the critical role native bees play in the health and integrity of our natural habitats. A tremendous diversity of primarily bee-pollinated plants lies nestled within the wind-pollinated matrix of Midwestern oak-hickory forests, grasslands, and wetlands. Most of these bee-pollinated plants provide fruits and seeds that are of high value to a variety of birds and mammals, produce foliage consumed by herbivores, enhance soil-binding root systems, and support a host of invertebrates that serve as a food source for many animals.

In much the same way that bees support human health, they are also essential to the well-being of our natural habitats and many of the creatures in them. Wild bees are essential to the reproduction of a large diversity of plant life in Missouri, upon which other wildlife species depend. Goldfinches depend upon sunflowers for food and use native thistle down to line their nests. Sunflowers and thistle are bee-pollinated, meaning goldfinches depend on bees for food and nesting materials.

Missouri is home to nearly 450 native bee species. Some of these species are specialists, which have evolved alongside specific plants or families of plants and exclusively collect pollen from these species. Others are generalists and collect pollen from (and thus pollinate) a wide variety of flowering plants. Other animals pollinate as well — butterflies and moths, wasps, and flies — but bees are truly the premier pollinator of the temperate ecosystems. They intentionally collect pollen to care for their young, are strict herbivores, and are highly adapted (covered with hairs and possessing scopa or pollen baskets) to a life that revolves around pollen collection.

While much has been made of colony collapse amongst honeybees, native bees across the United States — including those in Missouri — are also in decline. However, a new study has uncovered a bit of good news and outlined a path forward in helping native bees recover.

Bees are specially equipped to collect pollen using hairs on their legs and abdomens, or pollen baskets — called corbicula — on their legs. Some bees, such as bumblebees and some sweat bees, vibrate the flower to shake the sticky pollen loose.



Bumblebee with fully packed corbicula (pollen baskets) on hind legs



Metallic green sweat bee on aster



Brown belted bumblebee on purple coneflower



Gerardo Camilo (Saint Louis University researcher) and a graduate student perform aerial netting at a community garden in St. Louis City, one of the 28 monitoring locations used to document bee abundance and diversity in St. Louis.

Bees in the City

Our cities — large and small — are where most of us live. Here, the value of bees and pollination is no less important but often under-appreciated, under-studied, and even unrecognized. Gardening in urban areas, from the community garden down to the backyard, and up to the rooftops, is becoming increasingly popular and important on a self-subsistence as well as an economic level. Our knowledge of native bees in cities and their importance to wildlife conservation and urban agriculture

indicates that cities are playing a crucial role as a refuge for native bees.

Beginning in 2013, MDC partnered with Saint Louis University researchers Gerardo Camilo and Damon Hall to survey native bee diversity in St. Louis. After surveying 28 locations for four years, Camilo and Hall discovered that St. Louis hosts nearly 45 percent of the bee diversity in the state.

“I kept looking at the numbers and looking at the species lists and scratching my head,” Camilo said. “It’s not what I’d expected. It’s not what I learned about wildlife in cities from ecology class. But St. Louis has a lot of bees.”

Parts of St. Louis revealed greater bee diversity and abundance because those areas provide higher quality habitat. Neighborhoods with blocks of manicured lawns had significantly less bee diversity than neighborhoods with varied landscape. In other words, bees benefit when urban lawns grow a little wilder.



Missouri's Native Bees

Missouri has five families of native bees, all with fascinating and complex adaptations and habits.

APIDS are the most well-known and include the bumblebees, long-horned bees, and carpenter bees. Their most visible members, the bumblebees, are social, but 90 percent of apids and other wild bees are solitary.

MEGACHILDS are known for their big mouths. Large cutting mouthparts allow them to collect pieces of leaves, soil, or plant resins to line their nests. These bees are solitary but will nest in groups and above the ground. They line their nests with soil or plant material and lay one egg in each chamber of the nest, with a pollen ball to feed each young.



In addition to the exciting abundance of species, St. Louis is also home to some rarely occurring bees, including the southern plains bumblebee (*Bombus fraternus*), whose population has declined 85 percent from historic levels. Another featured St. Louis City specimen is a specialist sweat bee that requires sandy soil for nesting and is infrequently found in floodplains. A rare cleptoparasitic bee, one of the rarest bees in North America — with less than 20 female specimens ever recorded — was found during two different sampling years at an urban farm in Ferguson. Cleptoparasitic bees, or cuckoo bees, are nest parasites. Many cuckoo bees parasitize a narrow range of host species and are useful as a health indicator of wild bee diversity in general. For cuckoo bees to persist, there must be a healthy population of the host wild bee on the landscape. Researchers found that St. Louis is home to 32 species of cuckoo bees, which is consistent with the findings that indicate a healthy diversity of wild bees in the city.

Top left: Erin Shank and Jenny Mullikin, graduate student of Gerardo Camilo, examine a *Svastra obliqua* captured at Calvary Cemetery in St. Louis City. *Svastra obliqua* is a long-horned bee that is a sunflower pollen specialist. *Svastra obliqua* prepares its nest exclusively with pollen collected from flowers in the Asteracea family. Top right: Female *Bombus griseocollis*. Bottom right: Two bumblebees await identification in the net.

HALICTIDS, or sweat bees, are easily identifiable as iridescent, beautifully colored green, yellow, and black. They are some of the smallest bees that can buzz-pollinate. In this process, the bee grabs the anther of the flower in its mandibles, curls its abdomen around the anther, and vibrates its wing muscles, causing the flower to release pollen. Many flowering plants require buzz pollination to release pollen for reproduction. Honeybees are not capable of buzz pollination, so these plants are dependent on native bees to perform this important duty.

ANDRENIDS are mining bees that are exclusively solitary and ground-nesting. They are often specialist pollinators

and are some of the first to emerge in the spring. Their emergence is tied precisely to the blooming of specific flowers. How andrenids know when to emerge from their winter homes 12–24 inches underground is a true phenomenon of the natural world.

COLLETIDS are known as plasterer or polyester bees. They nest in small cavities, such as the pith of a twig or underground, and are the smallest of the wild bees. While other bees carry pollen on their exteriors, colletids carry pollen in their crop or digestive tract. They use their digestive fluids to create a waterproof coating on the walls of their nest to protect the young larvae over the winter.

Generating a Buzz

Motivated by the study's results, Hall, with support from MDC, conducted native bee workshops and found city residents receptive and enthusiastic about planting with bee diversity as a goal.

"Most native bees are small and solitary, with a small foraging range," Hall said. "Many bees can live their entire lives in an area the size of an average city yard, provided there is a diversity of flowers. This fact makes this a global conservation issue where one person can make a difference."

Hall observed that a fundamental concern over pollinator health was a significant motivator for city residents to plant more flowers to support native bee diversity. Also, residents noticed that companion planting of native flowers helped them grow more and better vegetables. The native flowers attract native bees, which are better pollinators of many garden vegetables. In exchange for the extra flower power, the bees will provide highly efficient pollination for your food (See *Garden Partners for Pollinators* chart, Page 19).

South St. Louis resident Seth Goldkamp, whose backyard garden produces much of the food for his family of six, decided to plant native wildflowers, including bee balm and common milkweed next to his tomatoes, peppers, okra, and squash.

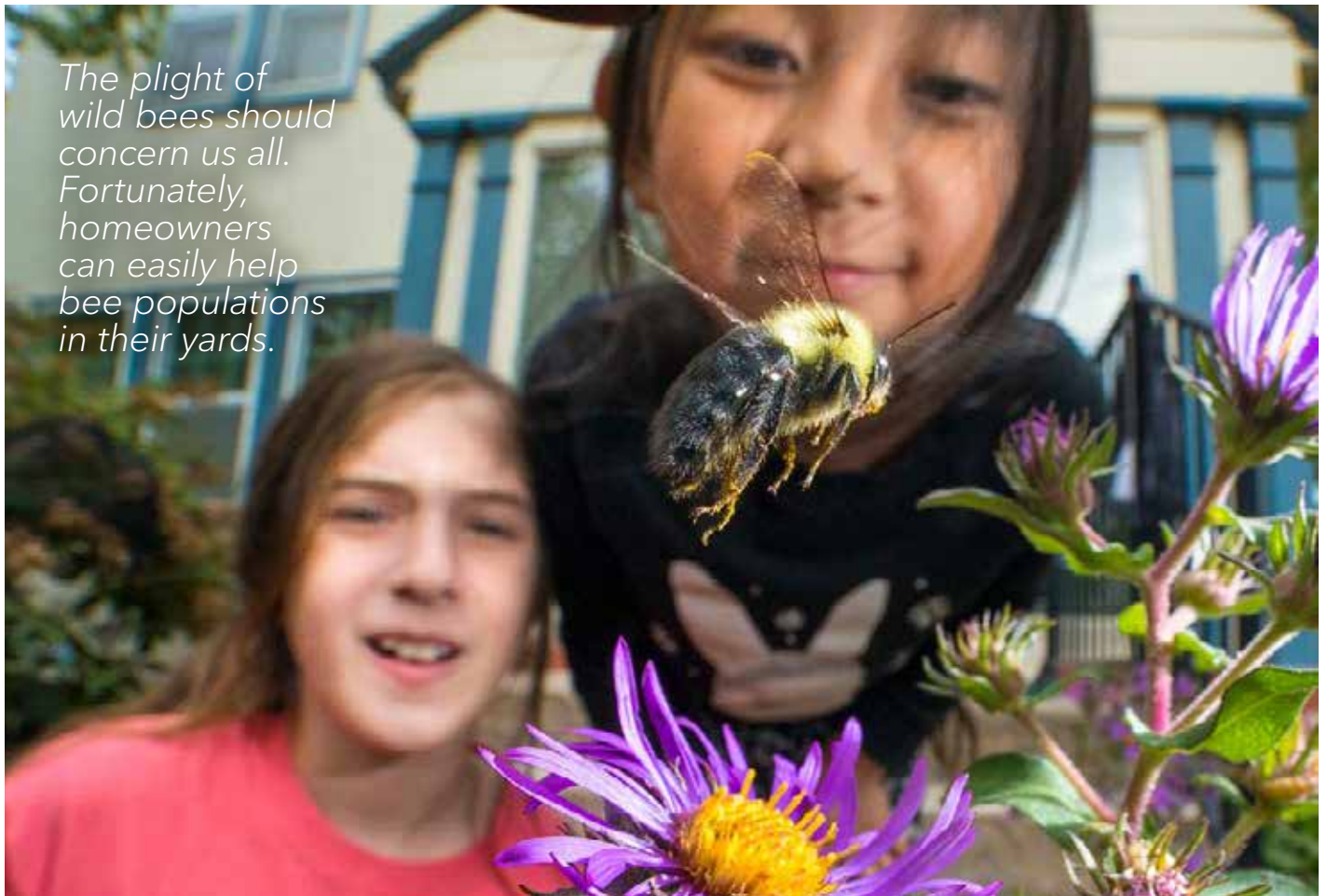
"I've been surprised at how our plants are now absolutely alive with bees of various shapes and sizes, and not just honeybees," said Goldkamp.

Supporting Bee Populations

The plight of wild bees should concern us all. Fortunately, homeowners can easily help bee populations in their yards. Start by planting flowers that will bloom throughout the season, especially early and late in the season, when fewer pollen and nectar sources are available. Avoid pesticides and any plants or seeds treated with neonicotinoids, as these are harmful to all insects, including bees. Neonicotinoids can be found on labels, listed as imidacloprid or acetamiprid.

Reduce mowing as much as possible. A solid green lawn is a desert to bees. When allowed to grow, common broadleaf lawn weeds provide food for bees. Research indicates that reducing mowing from once per week to once every two weeks can lead to a 60 percent increase in bee diversity. Reducing further to once every three weeks can result in a 300 percent increase in diversity. Finally, leave small patches of bare ground for bees to access nesting spots. Seventy percent of our native bees are ground nesters and small bare patches of ground will allow them to construct nests. Bee houses are also a good addition,

The plight of wild bees should concern us all. Fortunately, homeowners can easily help bee populations in their yards.



and they will provide for cavity nesters like mason and leaf-cutter bees. Bee houses can be interesting and beautiful additions to a garden, or they can be as simple as drilling some holes in the woodpile — though be sure not to burn those logs over the winter (See *A Place to Stay*, below).

Ultimately, the consistent predictor of urban bee health is floral resources. Bees need an abundance and diversity of flowers suitable for forage. The potential for bee conservation in the city is real and significant, Hall said.

“A diversity of people, with a diversity of flower preferences, supports a diversity of insect pollinators,” he said. ▲

Erin Shank is the urban wildlife biologist for the St. Louis Region. She loves enjoying the outdoors with her family.

Garden Partners for Pollinators

Garden plant	Native partner
tomato or pepper	foxglove, beardtongue, pale purple coneflower, or leadplant
cucumbers, squashes, or melons	native thistles, sunflowers, or wild bergamot
strawberries or blackberries	New Jersey tea, pale beardtongue, or wild hyacinth

A Place to Stay by Norman Murray

While providing nectar and pollen resources for bees is important, you can make your yard even more inviting to native bees by providing nesting places. Nesting areas fall into three categories: bare soil or sand, bee houses, and natural vegetation.

The majority of bees nest in the ground, so leaving an area of bare soil or sand in your yard is a quick and easy way to attract nesting bees. To prepare the ground for bees, several steps will help ensure success:

- Use loose, well-drained soil or sand exposed in sunny areas
- Do not till or otherwise disturb the soil during the growing season
- Fill a 2-foot-deep hole with fine sand and loam or provide a pile of sand and loam in a raised bed; even a planter box may be used
- Watch for small holes with bees entering/exiting for evidence of use

Bee houses can be built using wood or tubes. Bees will use mud caps to close the holes. Wood houses are made from untreated lumber and work best with the following features:

- Drill nesting holes between 3/32 and 3/8-inch diameter at ¾-inch centers into a block of untreated lumber
- Place holes at least 3–4 inches deep and closed at the back
- Install a roof



- Hang facing the east to get early morning sun; height isn't important

Tube houses are typically made from natural stems, like elderberry, cane, bamboo, and ragweed stems. Paper tubes can be made or purchased and used in a similar manner, but beware of any chemicals in the paper or glues, and keep them dry.

- Cut natural stems close to a node (swelled, closed portion of stem) and behind the next node to form a tube filled with pith closed at one end
- Diameters should vary to allow for different bee species to use them
- Bundle them together and fasten them into a frame or box and hang like a wood house, or hang them in a sheltered location where bees have access, such as under a roof overhang, in a shed's rafters, or under a deck

Perhaps the easiest way to help native bees is to do nothing — or at least postpone that fall garden cleanup. Some bees require nothing more than leaving standing dead stems and clumps of vegetation to overwinter in and use for nesting.

The Xerces Society for Invertebrate Conservation, which is an international nonprofit organization focusing on the conservation of invertebrates and their habitats, have two fact sheets with additional information on making and maintaining nesting options for native bees. Find them at short.mdc.mo.gov/ZWD and short.mdc.mo.gov/ZWz.



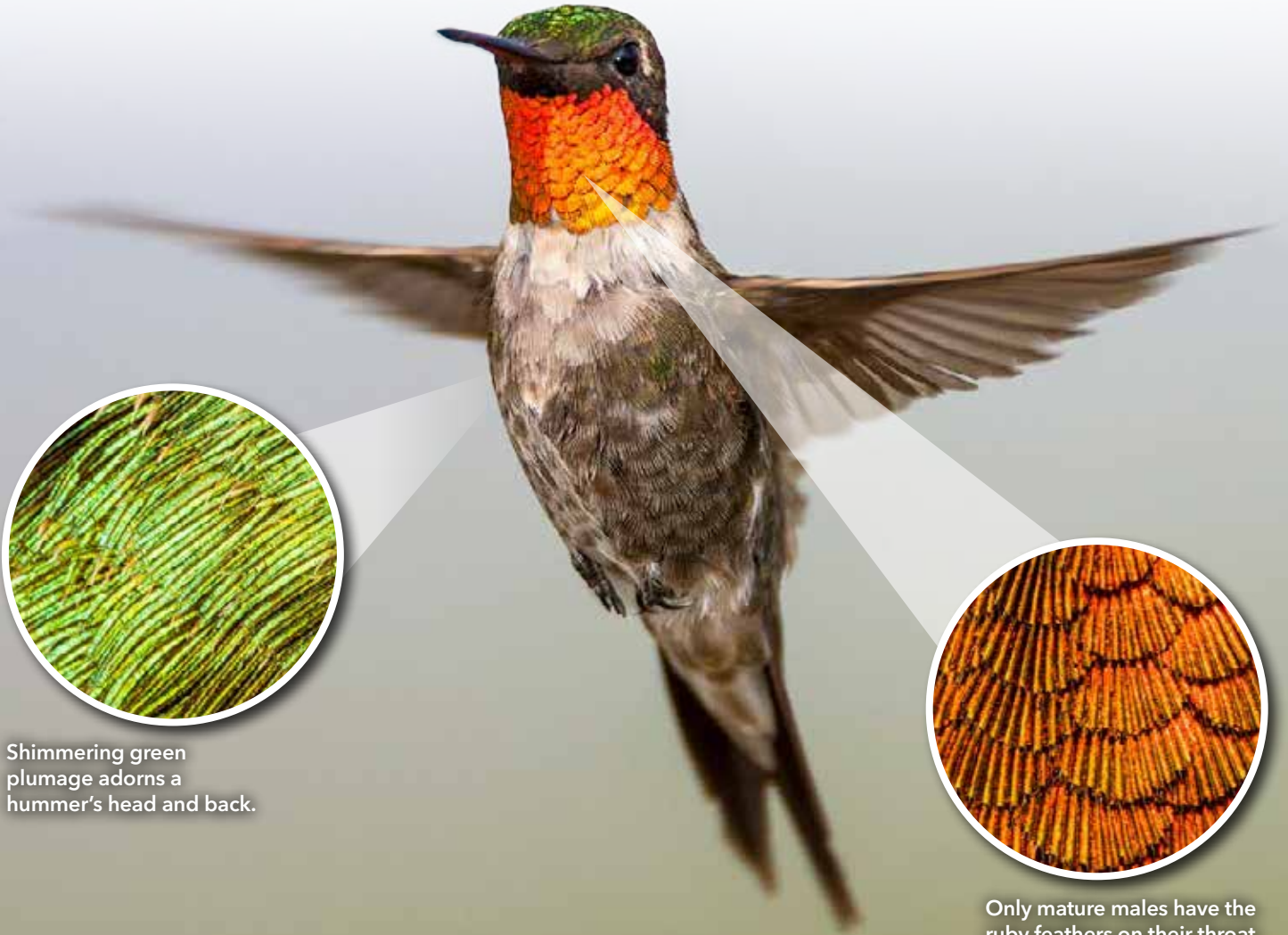
A ruby-throated hummingbird feeds on the nectar of a tall thistle.

HOSTING *Hummingbirds*

HELPFUL HINTS FOR
ATTRACTING ONE OF MISSOURI'S
FAVORITE MIGRANTS

by Larry Archer | photographs by Noppadol Paothong





Shimmering green plumage adorns a hummer's head and back.

Only mature males have the ruby feathers on their throat.

Ruby-throated hummingbird



As a retired nutritionist, Leslie Limberg spent her career advising patients on the necessity of eating properly. Even in retirement, nutrition continues to play a big role in her life, but her patients have changed considerably.

Now, from her home on 5 mostly wooded acres in New Melle west of St. Louis, Limberg spends her spring preparing for the nutritional needs of nature in general and ruby-throated hummingbirds in particular.

"Once a nutritionist, always a nutritionist," Limberg said. "I love to nurture and feed. When these hummingbirds started knocking on the door, which they do, they came to the right house."

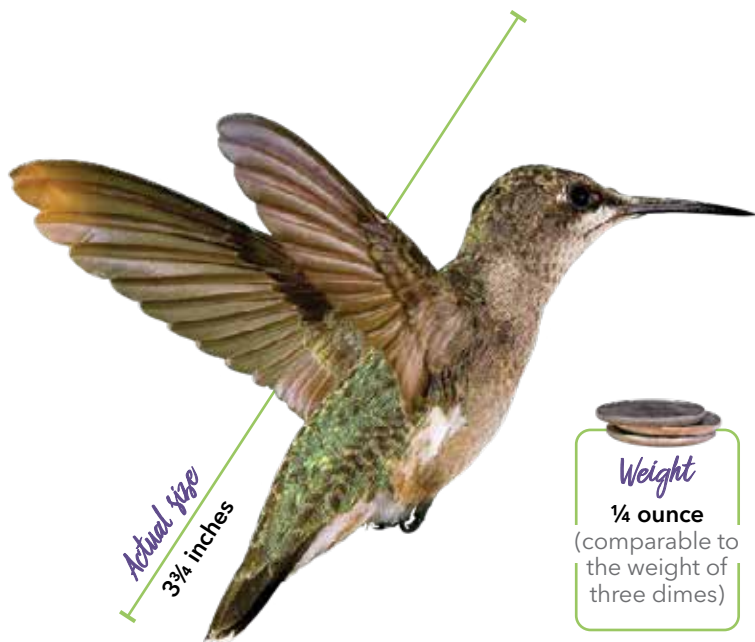
Starting in early to mid-April, Limberg will begin seeing the first of her feisty, flighty little guests from down south. There's one or two at first, but at the peak of the season, she'll play host to as many as 60.

Why Hummers

In Missouri, and virtually anywhere throughout its breeding range in the eastern United States, the ruby-throated hummingbird's annual arrival strikes joy in the hearts of those who see it, according to Missouri State Ornithologist Sarah Kendrick.

"People love feeding hummingbirds," Kendrick said. "They love these birds a lot. They're itty bitty and beat their wings over 50 times per second, and they migrate thousands of miles twice a year — I mean, what is not cool about that?"

In the case of the ruby-throated hummingbird, "itty bitty" means $3\frac{1}{4}$ inches long — from the tip of its beak to the end of its tail — and a top weight of roughly $\frac{1}{4}$ ounce — comparable to the weight of three dimes. It makes use of its blink-of-an-eye wing speed to make its annual trek from its winter home in



southern Mexico and most of Central America to its spring and summer breeding grounds throughout North America, mostly east of the Rocky Mountains, Kendrick said.

"It is the only eastern-nesting hummingbird in the United States," she said. "There are about 10 species that are found in the southwest or along the west coast. Sometimes we can see those species here if an individual is blown off course during migration."

The hummingbird's size and wing speed also make it capable of performing feats of flight that are impossible for other birds, which endears it to those who see it, Limberg said.

"They are like helicopters, they can go up and down — straight up and down," she said. "They can go backwards, forwards, to the left, to the right, just like a helicopter."

The ruby-throated hummingbird is Missouri's only common hummingbird species.

Hummingbirds are important pollinators for many species of plants that require a long-billed pollinator.

Nesting begins in mid-May. In summer, you can see broods traveling and foraging with their parents.

Our hummingbird numbers are greatest from August to late September during migration. By October 10, most ruby-throated hummingbirds have migrated south of Missouri.



Actual egg size

Females lay 1–2 broods each summer, with 1–3 eggs per brood.



Actual nest size

Tiny nests are built to expand as the young grow — typically with spider silk and down from thistle or dandelion.



The hummingbird's long beak makes it uniquely qualified to draw nectar from plants with deep blooms, like the trumpet creeper.

Feeders First

In an effort to attract hummingbirds, the first step is also the most intuitive — putting out a hummingbird feeder. While Pinterest overflows with plans for making elaborate hummingbird feeders, commercially made feeders are relatively inexpensive. Unlike the seed used for most bird feeders, hummingbird feeders use a simple sugar water mixture, Kendrick said. (See *Nectar Notes and Feeder Facts* below.)

“If you put out a feeder and there are hummers in your area, they’ll use it, but you may have to give them some time to find it,” she said.

While hummingbirds are attracted to red, the sugar water doesn’t need to be red, and the dye can be harmful to the birds, Kendrick said.

“Most feeders are red, so the birds will be attracted to it already. Red native plant species also help to attract the birds to your yard,” she said.

Limberg’s hummer hotel, which began with a single “old feeder from a garage sale,” now consists of up to 10 feeders at the peak of the season.

“We moved in here in 2001, and we put up a feeder, why not?” she said. “And the next year, we put up two. And it’s just multiplied like that.

“The second week of April is a religious time around here. April 15 is the cutoff point where we will have at least one or two.”

Although most hummingbirds have begun their southward trek by early October, Kendrick recommends leaving

feeders in place through mid-October to help stragglers. Leaving the feeders up an extra week or two after you think the last birds have moved through is a good idea, she said.

“There may be some late birds that it may help out,” she said. “And what’s the harm in leaving them up a little bit longer?”

Contrary to at least one hummingbird misconception, having the feeders out later at the end of the season does not tempt hummingbirds to delay their migration.

“Birds are prompted to migrate by other cues, including day length,” she said. “They know when it’s time to go. A feeder isn’t going to keep them here.”

Success has come with a price for Limberg. Playing host to such hyperactive houseguests requires regular attention, which



Nectar Notes and Feeder Facts

For many people, attracting hummingbirds begins and ends with putting out a hummingbird feeder. While commercially produced nectar is available, most of it contains red dye and making nectar at home is simple and much cheaper.

A mixture of one part table sugar dissolved into four parts of boiling water is the recipe for hummingbird nectar. Other sweeteners, such as honey or artificial sweeteners, are harmful to hummingbirds and should not be used. Allow the heated sugar water mixture to cool before placing the feeder.

If you’re fortunate to draw hummingbirds in large numbers, your challenge will be to keep the feeders full. If the attendance at your feeder is more modest, you will need to replace the nectar in the feeder, said MDC State Ornithologist Sarah Kendrick.

“Generally, feeders are out when it’s hot, and the water can get kind of opaque or cloudy due to bacteria,” Kendrick said. “You want to replace the sugar water every week if it’s really hot, or every two weeks if the weather is cool before it can become harmful. Wash feeders with a diluted vinegar solution and a bottle brush before refilling.”





results in the purchase of enough sugar to raise eyebrows at the local grocery store. From the arrival of the first hummers in April through the final departure in October, Limberg goes through approximately 135 pounds of sugar.

"In the middle of summer, they will empty a 20-ounce feeder in about five hours," she said.

Habitats Help

If putting out feeders is the equivalent of putting out the welcome mat for hummingbirds, then improving the habitat around your house with native plants is the equivalent of putting out a breakfast buffet (See *A Breakfast Buffet for Hummingbirds* on the following page).

"All birds, including hummingbirds, are more likely to visit and return to a yard that provides the things that they need, including food, water, and shelter. The best way to achieve all three is through feeders and native plants," Kendrick said. "If you want to attract hummingbirds, plant red native plants — most natives are perennials, so they'll be long-lasting and come back the following year."

Developing a hospitable habitat is something Limberg, who has been a Master Naturalist since 2005, has taken to heart. In 2011, she was awarded the St. Louis Audubon Society's "Bring Conservation Home" Platinum habitat designation. The habitat she's created on her property has also been recognized by the National Wildlife Federation and Xerces Society.

In addition to providing nectar, native plants also attract insects that become additional nutrition for hummingbirds, she said.

"They eat gnats, mosquitoes, spiders, aphids, flies, caterpillars, leaf hoppers," she said. "They eat pollen — of course nectar as everybody knows — beetles, a little tree sap, if nothing else in weather like this."



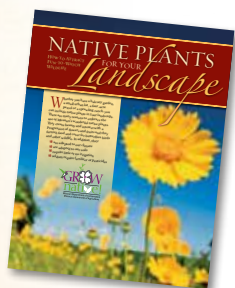
Ruby-throated Hummingbirds in Missouri is available free for Missouri residents. Order a copy from pubstaff@mdc.mo.gov or by calling 573-522-0108. Provide the publication title and your shipping address.

A Breakfast Buffet for Hummingbirds

There are many native plants recommended for attracting hummingbirds. The Missouri Prairie Foundation's Grow Native! website (grownative.org) has developed a top 10 list of hummingbird friendly natives.

MDC's *Native Plants for Your Landscape* includes a suggested landscaping plan for attracting hummingbirds. It is available online at short.mdc.mo.gov/Zc8.

All plants have specific requirements when it comes to the amount of sunlight, moisture, and soil type needed to thrive. Make sure to know your resources before buying and planting natives.



Cardinal flower



Jewelweed



Copper iris



Red buckeye



Coral honeysuckle



Royal catchfly



Crossvine



Trumpet creeper



Indian pink



Wild columbine





In maintaining a habitat-specific area, sometimes less is more, she said.

"We don't take out the weed whacker until the end of April, because there's little insects in the pith of the large goldenrod stalks and the other fat stalks, ironweed or whatever," she said. "It's a messy garden, but it's all very deliberate."

While nectar is important to hummingbirds, having the supply of insects that come with native plants, shrubs, and trees is also important for nestlings, Kendrick said.

"Hummingbirds feed insects to their young after the first few weeks," she said. "Adults regurgitate their food for nestlings younger than that, which includes both nectar and insects, but the young also rely heavily on a diversity of insects."

One For All

While hummingbirds take top billing, preparing a landscape for them also makes an inviting area for other bird species and wildlife in general, Limberg said.

"You can't just live for hummingbirds," she said. "You live for hummingbirds and butterflies. And then you live for

hummingbirds, butterflies, and pollinators, so you get everybody else in the mix."

The result, she said, is a front row seat to the circle of life.

"Everybody's in the game together," she said. "You can't take care of one without taking care of the others, because they all interact, and they're all neighbors." ▲

Larry Archer is the associate editor of the Missouri Conservationist and counts himself among those who anxiously awaits the arrival of ruby-throated hummingbirds in the spring.



Get Outside

in FEBRUARY →

Find more events in your area at mdc.mo.gov/events

Ways to connect with nature



Robins Return

Many American robins spend the winter in Missouri, while others head south when berries and other foods disappear. Look for large flocks returning to the Show-Me State around the third week of February. You can help Journey North track their migration at journeynorth.org/tm/robin/Report.html.



ST. LOUIS REGION

Maple Sugaring

Saturday, Feb. 15 • 9:30–11 a.m.
Rockwoods Reservation
2751 Glencoe Road, Wildwood, MO 63038
Registration required.
Call 888-283-0364 or register online at short.mdc.mo.gov/ZdA by Feb. 14.
All ages

It's time to tap the trees! Make maple syrup fun for your family, even with just one or two trees at home. Learn about sugar maple trees, how to tap trees, and turn sap into syrup. The entire program will be outdoors, so please dress for the weather.



Air Show

From February through March, American **woodcocks** perform amazing dances in midair to attract mates. To see a performance, head to a wet pasture, woodland, or cemetery at sundown and listen for a male woodcock's call: "peent." When the peenting stops, scan the sky. You might see the lovestruck male spiraling high into the air. This is just the start of his dance.

LEAST SHREW: STURGIS MCKEEVER, GEORGIA SOUTHERN UNIVERSITY; BUGWOOD.ORG

Natural Events to See This Month

Here's what's going on in the natural world.



Least shrews are born



Northern pintails and mallards migrate north



Tiger salamanders begin courting

SOUTHWEST REGION

Bluebird Workshop

Saturday, Feb. 15 • 10 a.m.–noon
Shepherd of the Hills Conservation Center
483 Hatchery Road, Branson, MO 65616
Registration required. Call 888-283-0364 or register
online at short.mdc.mo.gov/ZWp by Feb. 15.
All ages

Join us to learn more about Missouri's state bird. We will also build 12 bluebird nest boxes. Each family will work together to build one box to take home. Bring a hammer.



Eastern bluebird

Tree ID

February can be a good time to take a walk in the woods and learn about Missouri's wide variety of trees. For instance:

persimmon bark
is blocky



hackberry bark
is bumpy



river birch bark
peels like paper



For more information about trees, visit mdc.mo.gov/field-guide.



Call of the Wild

We often associate February with love. After all, Valentine's Day is Feb. 14. So, it's no surprise that wildlife is also looking for love this time of year. Listen for mating calls from bobcats, foxes, raccoons, woodcocks, and other critters, especially at night.



Winter Adventures

Sights and sounds of nature are distinct in winter, which makes it a perfect time to get outside.

Embark on a winter hike

Search for animal tracks, especially after a snowfall

Capture images of wildlife

Look for bald eagles along Missouri's big waterways

Identify trees by their bark pattern



Adventures are closer than you think. Download the **MO Outdoors** app today.



Harbinger of spring and **Ozark witch-hazel** bloom



Places to Go

NORTHEAST REGION

Sugar Creek Conservation Area

Multi-use trails make for sweet rides

by Larry Archer

✳ **Horses have a well-known** love of sugar, so it seems appropriate that an area named Sugar Creek Conservation Area (CA) should have so much to offer horses and their riders.

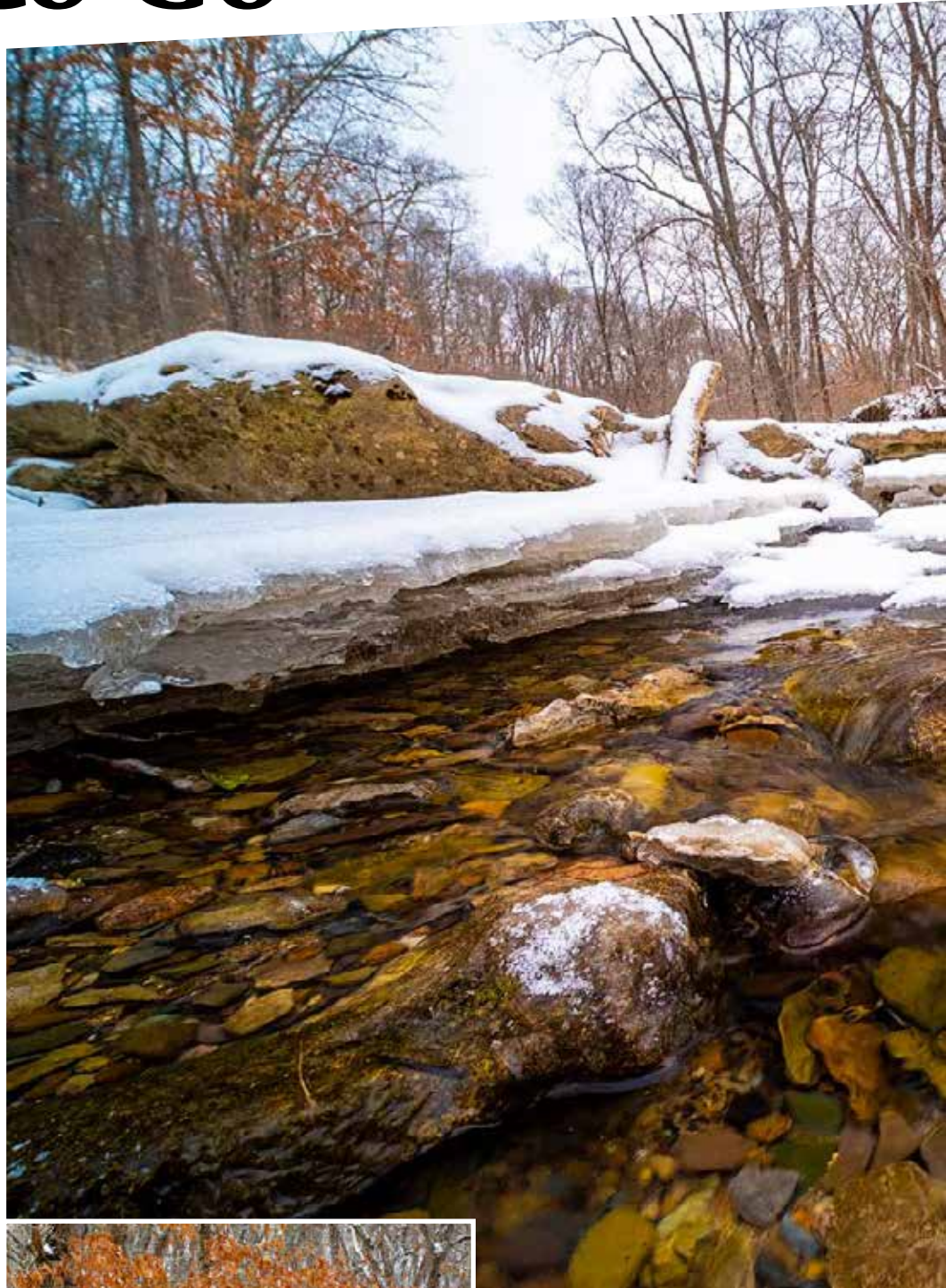
Located just southwest of Kirksville in Adair County, this 2,603-acre, mostly forested area offers several options for equestrians, bicyclists, and hikers, said Sugar Creek CA Manager Yvette Amerman.

"It has 10 miles of horse trails, or multi-use trails," Amerman said. "Those are broken up into three sections, each one has a different mileage on it. They can horseback ride or bicycle or, if you wanted to go on a walk, you could do that on any of those."

Horseback riders wanting to turn their trail ride into a two-day event are welcome to participate in overnight camping with their mounts, or "horse camping," she said.

"If you're going to horse camp, it needs to be in Parking Lot A, and that's mainly because it's big enough to turn a horse trailer around in," she said. "But everyone needs to know there are no permanent tie-outs and you must pack in your own water."

Hikers reluctant to share a multi-use trail with riders and bikers can enjoy the area's 2-mile hiking-only trail.



"It is close to Kirksville, which is always a plus for people who just want to day-use. You're only about 10 minutes or less from Kirksville."

—Sugar Creek CA Manager
Yvette Amerman

NORRADOI PAOTONG



SUGAR CREEK CONSERVATION AREA

consists of 2,603 acres in Adair County. From
Kirksville, take Highway 11 west 4 miles, then
Route N south 0.25 mile to the area.

N40° 07' 17.04" | W92° 38' 24.72"

short.mdc.mo.gov/ZPM 660-785-2420

WHAT TO DO WHEN YOU VISIT



Birdwatching Included in the National Audubon Society's Thousand Hills Woodland and Forest Important Bird Area (short.mdc.mo.gov/ZPA). Included in the Great Missouri Birding Trail (short.mdc.mo.gov/ZPO). The eBird list of birds recorded at Sugar Creek CA is available at ebird.org/hotspot/L349422.



Camping Designated campsites available. Open camping (walk-in, backpacking) allowed.



Fishing Black bass, catfish, sunfish



Hiking 2-mile hiking trail. 10-mile multi-use trail (biking, equestrian, and hiking).



Hunting Deer and turkey
Deer and turkey regulations are subject to annual changes. Please refer to the Spring Turkey or Fall Deer and Turkey booklets for current regulations.

Also **squirrel**

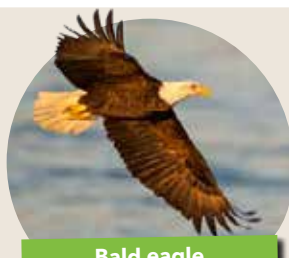


Shooting Range Unsupervised shooting range with 25-, 50-, and 100-yard shooting lanes.

WHAT TO LOOK FOR WHEN YOU VISIT



White-tailed deer



Bald eagle



Squirrel



Wild turkey



Striped Skunk

Mephitis mephitis

Status
Common

Size
Length: 20–30 inches, weight: 2½–11½ pounds

Distribution
Statewide, fewer in the
Bootheel's Mississippi Lowlands



Did You Know?

Skunks usually warn their target before spraying their signature musk. They stamp their feet and hold their tail high in the air. If you are near a skunk and see these two signs, it's a good indication to go the other way.

The striped skunk is as well known for its distinctive black coat and white stripe as it is its recognizable scent. Skunks are common Missouri residents that prefer brushy fields and forest borders with nearby sources of water. Their dens are typically in the ground, but they will use a stump, cave, rock or wood pile, haystack, or farm building if necessary.



LIFE CYCLE

You will begin to see more skunks this month as they begin breeding. Their litters of four to six young are born from May to early June. As temperatures begin to drop in early autumn, skunks take to their dens, but they do not hibernate. They sleep intermittently.



FOODS

Striped skunks forage for food at night. Eating both plants and animals, they are considered omnivores. During the spring and summer, insects are their preferred meal. They will also eat mice and rats, moles, shrews, ground squirrels, young rabbits, and chipmunks. Skunks will catch and consume small mammals, but will eat larger mammals as carrion.



ECOSYSTEM CONNECTIONS

Despite their well-known funk, skunks do a lot of good for nature. As scavengers, they serve as the woods' clean-up crew. In addition, skunks consume smaller animals and insects, helping to control their populations.

Outdoor Calendar

❖ MISSOURI DEPARTMENT OF CONSERVATION ❖



Free MO Hunting and MO Fishing Apps

MO Hunting makes it easy to buy permits, electronically notch them, and Telecheck your harvest. MO Fishing lets you buy permits, find great places to fish, and ID your catch. Get both in Android or iPhone platforms at short.mdc.mo.gov/Zi2.

FISHING

Black Bass

Impounded waters and non-Ozark streams:
Open all year

Most streams south of the Missouri River:
May 25, 2019–Feb. 29, 2020

Nongame Fish Giggling

Impounded Waters, sunrise to sunset:
Feb. 1–Sept. 14, 2020

Paddlefish

Statewide:
March 15–April 30, 2020

On the Mississippi River:
March 15–May 15, 2020
Sept. 15–Dec. 15, 2020

Trout Parks

Catch-and-Release:
Nov. 8, 2019–Feb. 10, 2020

TRAPPING

Beaver, Nutria

Nov. 15, 2019–March 31, 2020

Otters, Muskrats

Nov. 15, 2019–Feb. 20, 2020

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code of Missouri* at short.mdc.mo.gov/Zib. Current hunting, trapping, and fishing regulation booklets are available from local permit vendors or online at short.mdc.mo.gov/ZZf.

HUNTING

Coyote

Restrictions apply during April, spring turkey season, and firearms deer season.

Open all year

Crow

Nov. 1, 2019–March 3, 2020

Deer

Archery:
Sept. 15–Nov. 13, 2020
Nov. 25, 2020–Jan. 15, 2021

Firearms:

- ▶ Early Youth Portion (ages 6–15):
Oct. 31–Nov. 1, 2020
- ▶ November Portion:
Nov. 14–24, 2020
- ▶ Late Youth Portion (ages 6–15):
Nov. 27–29, 2020
- ▶ Antlerless Portion (open areas only):
Dec. 4–6, 2020
- ▶ Alternative Methods Portion:
Dec. 26, 2020–Jan. 5, 2021

Rabbit

Oct. 1, 2019–Feb. 15, 2020

Squirrel

May 25, 2019–Feb. 15, 2020

Turkey

Archery:
Sept. 15–Nov. 13, 2020
Nov. 25, 2020–Jan. 15, 2021

Firearms:

- ▶ Youth (ages 6–15): April 4–5, 2020
- ▶ Spring: April 20–May 10, 2020
- ▶ Fall: Oct. 1–31, 2020

Waterfowl

See the Waterfowl Hunting Digest or visit short.mdc.mo.gov/ZZx for more information.



ILLUSTRATION: MARK RAITHEL



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If your neck of the woods looks like this, don't let it keep you indoors! Who knows what you might discover once you step outside — a new trout fishing hole, a maple tree to tap, trails to traverse, or Ozark witch-hazel in bloom. For ideas, visit nature.mdc.mo.gov.

📷 by **Noppadol Paothong**